

CLAIMS

1. A substrate processing apparatus, comprising:

a carrier block (B1) including a carrier placement portion (21) to/from which a
5 substrate carrier (C) storing a plurality of substrates is loaded/unloaded, and first
transfer means (22) for performing delivery of the substrate with respect to the substrate
carrier (C) placed on the carrier placement portion (21);

second transfer means (23) provided adjacent to the carrier block (B1) and for
transferring the substrate along a linear transfer path extending in a lateral direction;

10 a first delivery stage (24) for performing delivery of the substrate between said
first transfer means (22) and said second transfer means (23);

a plurality of process blocks (B3, B4, B5) each including a plurality of process
units (U1, U2, U3) for performing predetermined processing on the substrate, third
transfer means (31) for transferring the substrate between the process units (U1, U2,
15 U3), and a second delivery stage (TRS1, TRS2) for performing delivery of the substrate
between said second transfer means (23) and said third transfer means (31), said process
blocks (B3, B4, B5) being provided with respect to a main body of the apparatus to be
arranged along said transfer path, and performing a series of substrate processing on the
substrates in units of the process blocks (B3, B4, B5);

20 a process block control portion (82A, 82B, 82C) controlling operations of said
third transfer means (31) and the respective process units (U1, U2, U3) and outputting
processing information of the substrates within the corresponding process block (B3, B4,
B5) such that predetermined processing is performed on the substrates in each of the
process blocks (B3, B4, B5) based on a predetermined recipe; and

25 means (83) for determining a process block (B3, B4, B5) where there is no
substrate or where a final step for the last substrate within the relevant process block
(B3, B4, B5) will be finished earliest based on the processing information of the
substrates from the process block control portions (82A, 82B, 82C) before the substrate

is delivered from the first delivery stage (24) to the second transfer means (23), and for controlling the second transfer means to transfer the substrate on said first delivery stage (24) to the relevant process block (B3, B4, B5).

5 2. The substrate processing apparatus according to claim 1, wherein first and second lots containing a plurality of substrates are stored in said substrate carrier (C), and said means (83) for controlling the second transfer means controls the second transfer means (23) such that, when the last substrate in said first lot is being processed in one of said process blocks (B3, B4, B5), if the other process block (B3, B4, B5) is
10 not performing substrate processing, the first substrate in the second lot is transferred to that process block portion which is not performing the processing to allow the substrate to be processed in the relevant process block portion.

15 3. The substrate processing apparatus according to claim 1, wherein an interface portion (B6) to which a light exposure device (B7) is connected is connected to a side of said transfer path opposite to a side connected to the carrier block (B1).

20 4. The substrate processing apparatus according to claim 1, wherein an interface portion (B6) to which a light exposure device (B7) is connected is connected to a side of said transfer path opposite to a side connected to the process blocks (B3, B4, B5).

25 5. The substrate processing apparatus according to claim 1, wherein said process block (B3, B4, B5) includes a coating unit (32) for applying a resist solution to the substrate, a developing unit (33) for performing developing processing on the substrate after exposure to light, a heating unit (PEB, LHP, PAB) for heating the substrate, the third transfer means (31) for transferring the substrate between the units, and the second delivery stage (TRS1, TRS2) for performing delivery of the substrate

between said second transfer means (23) and said third transfer means (31), and such application of the resist solution and/or the developing processing after exposure to light is performed on the substrate in units of each process block (B3, B4, B5).

5 6. The substrate processing apparatus according to claim 5, wherein said process block (B3, B4, B5) includes a plurality of such coating units (32), a plurality of such developing units (33), and a plurality of such heating units (PEB, LHP, PAB), and said process block control portion (82A, 82B, 82C) further includes a function to select the coating unit (32), the developing unit (33) and the heating unit (PEB, LHP, PAB)
10 for use in the processing based on the process recipe of the substrate.

 7. The substrate processing apparatus according to claim 1, wherein each process block (B3, B4, B5) includes a liquid process unit (U1) performing processing on the substrate using a chemical solution, a heating unit (PEB, LHP, PAB) for heating the
15 substrate, the third transfer means (31) for transferring the substrate between the units, and the second delivery stage (TRS1, TRS2) for performing delivery of the substrate between said second transfer means (23) and said third transfer means (31), and a series of processing are performed on the substrate in units of each process block (B3, B4, B5).

20 8. The substrate processing apparatus according to claim 7, wherein said process block (B3, B4, B5) includes a plurality of such liquid process units (U1) and a plurality of such heating units (PEB, LHP, PAB), and said process block control portion (82A, 82B, 82C) further includes a function to select the liquid process unit (U1) and the heating unit (PEB, LHP, PAB) for use in the processing based on the process recipe
25 of the substrate.

 9. The substrate processing apparatus according to claim 7, wherein said liquid process unit (U1) is for forming a coating film.

10. The substrate processing apparatus according to claim 7, wherein said liquid process unit (U1) is for coating the substrate with a chemical solution containing a precursor of an insulating film.

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11. The substrate processing apparatus according to claim 1, wherein said plurality of process blocks (B3, B4, B5) are formed to have the same size in two dimensions.

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12. The substrate processing apparatus according to claim 1, wherein said second transfer means (23) is provided at a transfer block that extends along arrangement of the plurality of process blocks (B3, B4, B5), and each process block (B3, B4, B5) is configured to be attachable to and detachable from the transfer block.

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13. A substrate processing method, provided with first transfer means (22) for performing delivery of a substrate with respect to a substrate carrier (C) containing a plurality of substrates, second transfer means (23) for performing delivery of the substrate with respect to the first transfer means (22) via a first delivery stage (24), and a plurality of process blocks (B3, B4, B5) each including a plurality of process units (U1, U2, U3) for performing predetermined processing on the substrate, third transfer means (31) for transferring the substrate between the process units (U1, U2, U3), and a second delivery stage (TRS1, TRS2) for performing delivery of the substrate between said second transfer means (23) and said third transfer means (31), a series of substrate processing being performed in said process blocks (B3, B4, B5) with respect to the substrates in said substrate carrier (C) in units of the process blocks (B3, B4, B5), the method comprising the steps of:

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the first transfer means (22) transferring the substrate within the substrate carrier (C) to the first delivery stage (24);

determining the process block (B3, B4, B5) where there is no substrate or where a final step for the last substrate within the relevant process block (B3, B4, B5) will be finished earliest, based on processing information of the substrates in the respective process blocks (B3, B4, B5), before the second transfer means (23) receives the
5 substrate of the first delivery stage (24); and

subsequently, the second transfer means (23) receiving the substrate placed on said first delivery stage (24) and transferring the relevant substrate to said determined process block (B3, B4, B5).

10 14. The substrate processing method according to claim 13, wherein said process block (B3, B4, B5) includes a coating unit (32) for applying a resist solution to the substrate, a developing unit (33) for performing developing processing on the substrate after exposure to light, a heating unit (PEB, LHP, PAB) for heating the substrate, the third transfer means (31) for transferring the substrate between the units,
15 and the second delivery stage (TRS1, TRS2) for performing delivery of the substrate between said second transfer means (23) and said third transfer means (31), and such application of the resist solution and/or the developing processing after exposure to light is performed on the substrate in units of each process block (B3, B4, B5).

20 15. The substrate processing method according to claim 14, wherein said process block (B3, B4, B5) includes a plurality of such coating units (32), a plurality of such developing units (33), and a plurality of such heating units (PEB, LHP, PAB), and when the process block (B3, B4, B5) to which the substrate placed on said first delivery stage (24) is to be transferred is determined, the coating unit (32), the developing unit
25 (33) and the heating unit (PEB, LHP, PAB) for performing the processing on said substrate are selected in the relevant process block (B3, B4, B5), and the application of the resist solution and/or the developing processing after exposure to light is performed on the substrate in units of each process block (B3, B4, B5).

16. The substrate processing method according to claim 13, wherein each process block (B3, B4, B5) includes a liquid process unit (U1) performing processing on the substrate using a chemical solution, a heating unit (PEB, LHP, PAB) for heating the substrate, the third transfer means (31) for transferring the substrate between the units, and the second delivery stage (TRS1, TRS2) for performing delivery of the substrate between said second transfer means (23) and said third transfer means (31), and a series of processing are performed on the substrate in units of each process block (B3, B4, B5).

17. The substrate processing method according to claim 16, wherein said process block (B3, B4, B5) includes a plurality of such liquid process units (U1) and a plurality of such heating units (PEB, LHP, PAB), and when the process block (B3, B4, B5) to which the substrate placed on said first delivery stage (24) is to be transferred is determined, the liquid process unit (U1) and the heating unit (PEB, LHP, PAB) for performing the processing on said substrate are selected in the relevant process block (B3, B4, B5), and predetermined substrate processing is performed on the substrate in units of each process block (B3, B4, B5).